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The flowers of *Phlox canescens* are very often pink or purple, as well as "white."

The seeds of *Erythraea Douglasii* are not "globular" in a great many plants. They also vary in size.

Salt Lake City, Utah.

MARCUS E. JONES.

***Onoclea sensibilis*, var. *obtusilobata*.**—Seeing the notes in the September and October BULLETINS on that form of *Onoclea sensibilis* usually called variety *obtusilobata*, I thought it might be of interest to state in what localities we have found it, and something of my experience in trying to cultivate it in my garden.

I first found, growing in profusion, in a low marshy meadow, some of the finest fertile *obtusilobata* forms, from the same rootstocks on which were the ordinary sterile fronds. Growing side by side in this meadow were all the forms mentioned by Mr. Underwood, as well as some with acute segments open in fructification. When I first visited this spot and found the finest specimens, it had not been mown over; but since that it has been mown every year, and the specimens are not so fine *obtusilobata*. I have also found it growing by roadsides at Pompey Hill, in dry localities, regularly mown. There, most of the fronds more nearly approached the normal sterile form, some having one-half entirely sterile and not at all contracted.

Last year, on our first visit to Cicero Swamp, Mrs. Myers found a great abundance of *obtusilobata* in a portion of the swamp which had been cleared of trees, but not burnt over nor at all cultivated. In the sphagnum, near by, we found *Chiogenes hispidula* and *Gaultheria procumbens*.

In a swampy woods, near Centerville, we have found, several years in succession, fine specimens of *obtusilobata*, while on the Jamesville Road, a few years ago, there used to be a long stretch of the beautiful *Onoclea sensibilis* (never any of the variety) skirting a rich low wood; but the hand of the spoiler felled the woods, and since that time it has all died out without ever showing any *obtusilobata* forms.

Often, when I have found what seemed to me the most perfect *obtusilobata*, I have brought it home and planted it in my fern-bed in the garden only to have it show fine normal sterile fronds (no fertile ones whatever) while by its side *Struthiopteris Germanica*, collected from similar localities, would send up year after year good healthy fertile fronds.

Whether all of this will aid much in proving that *obtusilobata* is no variety and that it is an effort of the species to form a variety, or whether a reversion, I greatly doubt.

Syracuse, N. Y.

MARY OLIVIA RUST.

Myco-Lichens.—In the recent work by Dr. A. Minks, entitled *Symbolae Licheno-Mycologicae*, devoted to maintaining that a large number of Fungi, amounting to several thousands, are properly to be regarded as Lichens, a list of a considerable number of these Fungi, or Myco-Lichens is given. As several of these occur in this country, a list of them may be of interest to American fungologists,

and is given below. The plants considered, are arranged in series, probably to indicate their affinities, though it is not so stated. In the following list, the series are separated by a dash, and the page on which they are mentioned is given.

Dr. Minks is the most vigorous opponent of the Schwendener theory, that so-called lichens are only fungi parasitically associated with algae, who has yet appeared. His studies have been extensive and exhaustive. Unfortunately, the style in which his views are expressed is so difficult as to be anything but attractive; and few in this country, probably, will have the patience to read his work, *Das Microgonidium*, in which his doctrines are conveyed. He has many original opinions, some of which have not been verified by other observers; but several have seen the *microgonidium*, the organ which, according to Minks, is the fundamental one of lichen structure, and which distinguishes it absolutely from all fungus structure. The microgonidium is an extremely small, simple cell, which, under proper treatment, can be seen in all parts of lichens—in the hyphae, the paraphyses, the spermatia, and the spores, and its history and development are very fully treated in the work above-mentioned.

A few words will elucidate Dr. Minks's mode of treatment. A thin section of the thallus or apothecium of a lichen is to be soaked for a short time (from five to ten minutes), in *liquor potassae*. It is then to be washed and placed in dilute sulphuric acid for about three-quarters of an hour, or until it becomes of the consistence of soft putty. It is then to be placed on a slide, in water, and a small portion of solution of iodine added. With a suitable light, and sufficient magnifying power, the microgonidia are then visible, as minute cells of a bluish-green color. Dr. Minks recommends the use of an immersion lens, and a magnifying power of 1000, with the light reflected from a cloud. It is the detection of microgonidia in the tissues of the fungi enumerated, which leads Dr. Minks to include them among lichens; and a wide field is here opened for those who use the microscope.

1. *Tympanis picastra*, Berk & Curt. *Ala.*, p. 11.
 2. *T. Ravenelii*, B. & C. *S. Car.*, p. 12.
 3. *Phacidium elegans*, B. & C. *N. Car.*, p. 12.
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4. *Tympanis viticola*, (Schwein) Fr. *N. J.*, p. 36.
 5. *T. conspersa*, Fr. *N. J.*, p. 48.
 6. *T. fasciculata*, Schwein. *N. J.*, p. 48.
 7. *Cenangium Cerasi*, (Pers.) *Mass.*, p. 52.
 8. *C. Magnoliae*, B. & C. *Fla.*, p. 54.
 9. *Nodularia acericola*, Peck *N. Y.*, p. 55.
 10. *Dermatea carnea*, Cooke & Ellis. *N. J.*, p. 56.
 11. *D. carpinea*, (Pers). *Mass.*, *N. Y.*, p. 59.
 12. *Patellaria Rubi*, Lib. *N. J.*, p. 63.
 13. *Dermatea tabacina*, Cooke. *N. J.*, p. 69.
 14. *Cenangium turgidum*, Fr. *N. J.*, p. 71.
 15. *Lecidea resinae*, Fr. *N. E.*, p. 73.
 16. *Lecanidion fusco-atrum*, Rehm. *N. J.*, p. 81.
 17. *Patellaria atrata*, (Hedw.) *N. Y.*, p. 82.

18. *P. indigotica*, Cooke & Peck. *N. Y.*, p. 83.
 19. *P. cucurbitaria*, Cooke. *N. J.*, p. 84.
 20. *P. dispersa*, Gerard. *N. Y.*, p. 84.
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21. *Cenangium triangulare*, (Schw.). *N. J., Mass.*, p. 114.
 22. *Phacidium crustaceum*, B. & C. *Mass.*, p. 115.
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23. *Phacidium autumnale*, Fekl. *Iowa*, p. 131.
 24. *Patellaria ferruginea*, C. & E. *N. J.*, p. 150.
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25. *Phacidium dentatum*, Schmidt. *N. Y.*, p. 155.
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26. *Discella discoidea*, C. & P. *N. Y.*, p. 170.
 27. *Phacidium carbonaceum*, Fr. *N. Y.*, p. 172.
 28. *Discella leguminum*, Cooke. *Texas*, p. 174.
 29. *D. macrosperma*, Peck. *N. Y.*, p. 174.
 30. *Eustegia, Magnoliae*, Peck. *S. Car.* p. 175.
 31. *Patellaria, lignyota*, Fr. *N. J.*, p. 175.
 New Bedford, Mass. H. W.

Nutation in *Epilobium angustifolium*, L.—This plant, which is put down in the botanies as willow-herb, but is more frequently called fire-weed, exhibits the phenomenon of nutation in a very marked and interesting manner. The young flowers-buds at the tip of the raceme are erect. A little later, as the stem (axis of inflorescence) elongates, they point downwards and are closely pressed against the stem. Still later, the peduncles of the half-grown flower-buds begin to rise, and soon form nearly a right angle with the stem. Later still, when the buds are fully developed and begin to open, the angle is lessened to about forty-five degrees; while the fruits, when mature, are, for the most part, nearly or quite erect. Thus the flowers, or at least the ovaries, from the time of their formation to their fruiting, traverse, twice over, the arc of a circle of nearly ninety degrees. What advantage the plant gains by these movements it might be difficult to say. Possibly the movements may have some relation to those which are known to pertain to the stamens and style. Observations during the growing season, by any one having the opportunity, would no doubt bring out some interesting facts.

Cornell University.

A. N. PRENTISS.

Growth of Exogens. III.—This subject is one of such importance to science that I feel anxious to put before the botanists of the country all the information that comes into my possession.

In a conversation with one of the professors of Washburn College, Topeka, Kansas, on the growth of Exogens, he informed me that for some years he had charge of the trees upon the college grounds.

In order to get shade as soon as possible, the cottonwood (*Populus monilifera*) had been set alternating with other trees, with the design of removing the cottonwoods as they grew large enough to interfere with the growth of the more desirable trees.

In that locality a dry season occurs with marked constancy, be-